FINAL REPORT ON PHASE II OF THE SUBSURFACE INVESTIGATION AT TANKS 19T AND 20T AT THE C6 FACILITY REVISED 10 MAY 1988

Prepared for:

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Project No. 8741863D

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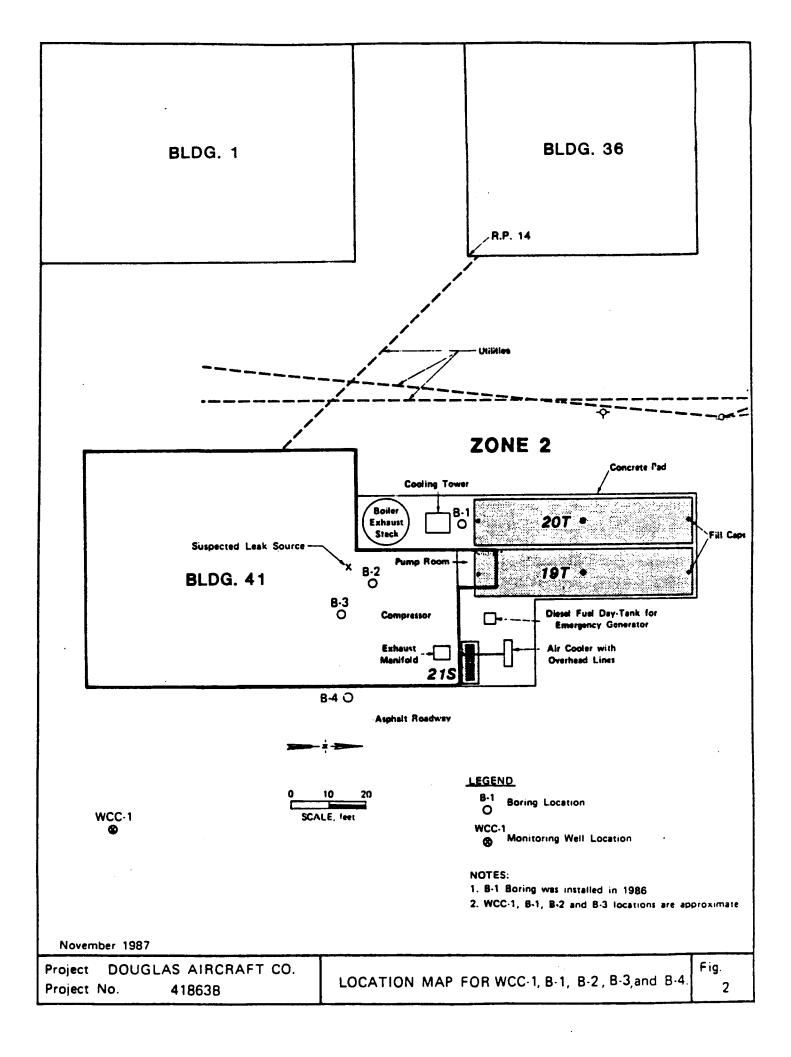
1.0 INTRODUCTION

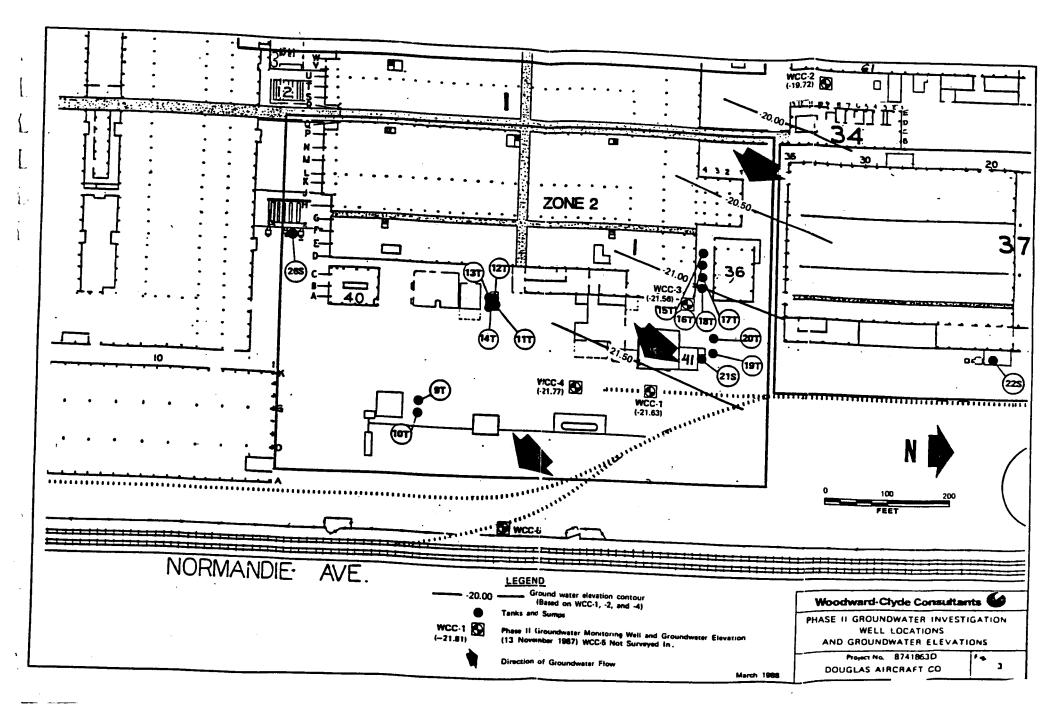
This report presents the results of Woodward-Clyde Consultants' Phase II subsurface investigation. This investigation was performed to evaluate the source of elevated concentrations of organic compounds in the soil and ground water near tanks 19T and 20T at Douglas Aircraft Company's C6 facility in Los Angeles, California. The location of the facility is shown on Figure 1.

The results of the Phase I Underground Tank Investigation Report (June 1987) indicated the presence of petroleum hydrocarbons in the soil to a depth of 50 feet in the vicinity of tanks 19T and 20T. In addition, 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, and benzene was detected in water samples collected from observation Well WCC-1, which was installed at a location thought to be downgradient of the tanks. The locations of borings and wells installed during the Phase I work are shown on Figure 2.

2.0 OBJECTIVE

The objective of this phase of the investigation was to evaluate the source of organic compounds in the soil and ground water near tanks 19T and 20T.





BOE-C6-0070645

On 30 October 1987, wells WCC-2, -3, and -4 were developed by Beylick Drilling Company of La Habra, California. Well WCC-5 was developed on 30 November 1987 by the same company. The observation wells were developed by a surge block and sand bailer method, and pumped with a submersible pump until the extracted water was free of visible suspended material. Water samples were collected and analyzed for volatile organics (EPA Method 8240) and petroleum hydrocarbons (EPA Method 8015). The well development and water sampling methods used are discussed in Appendix A.

Ground surface elevations of observation wells WCC-1, -2, -3, and -4 were surveyed on 3 November 1987 by Rattray and Associates, Inc. of Santa Ana, California. Observation well WCC-5 was installed on 24 November 1987 and was not surveyed. The survey provided the ground water elevation data required to evaluate the direction of the ground water gradient. The elevations of the well casings and ground water are summarized in Table 1.

4.0 RESULTS

4.1 Ground Water Elevations

Ground water elevation data collected on 13 November 1987 indicated that in the area defined by wells WCC-1, -2, -3, and -4, the elevation of ground water varies from -19.72 to -21.77 feet (Mean Sea Level [MSL]). These elevations indicate that the water table is over 19 feet below MSL. Water levels from wells completed in deeper aquifers in the vicinity of the site are also below MSL. Water level information from 1983 indicates that the water levels in these deeper aquifers are at approximately -60 feet MSL (Los Angeles Flood Control District). The low ground water levels found in the deep aquifers can be attributed to the reduced natural ground water recharge caused by urbanization of the Los Angeles Basin and the heavy use of ground water. Channelizing the Los Angeles and San Gabriel rivers also has significantly reduced recharge to the ground water system. The reduced recharge and heavy ground water extraction have produced a ground water overdraft and a subsequent lowering of the water table. The ground water levels in the semi-perched aquifer beneath the facility are probably being influenced by the same factors as the deeper aquifers, resulting in a ground water elevation below MSL.

4.2 Ground Water Gradient

The ground water gradient calculated from ground water elevations taken 13 November 1987 indicated a gradient sloping from the northwest to the southeast. The direction of ground water flow is illustrated on Figure 3. This ground water gradient was calculated through the use of gradient triangulation between wells WCC-1, -2, -3, and -4. The ground water gradient illustrated in Figure 3 is based on data from wells WCC-1, -2, -3, and -4, and may not reflect ground water gradients at other locations at the C6 facility.

4.3 Well WCC-5 Location

The southeast gradient of ground water (discussed in Section 4.2) allowed observation Well WCC-5 to be located along the property line, downgradient of the tank clusters. The location of WCC-5 is shown on Figure 3. The location was selected based on the ground water gradient established from observation wells WCC-1, -2, -3, and -4, and assumes that hydrogeologic conditions are not significantly different in the proposed location of Well WCC-5. This observation well was installed, developed, and sampled in the same manner as wells WCC-1, -2, -3, and -4.

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TABLE 2 GROUND WATER ANALYTICAL DATA Concentrations (ug/l)

		WCC-1		WCC			<u>c-3</u>		C-4	, MCC	
COMPOUNDS	3/27/87	4/13/87*	11/12/87	11/2/87	11/12/87	11/2/87	11/12/87	11/2/87	11/12/87	11/30/87	1/8/88
1,1-Dichloroethene (1,1-DCE)	2,800	3,700/2,500	3,000	5	2	38,000	88,000	360	1,200	7	4
1,1-Dichloroethane (1,1-DCA)		/	23	•-		••	1,000				• •
1,1,1-Trichloroethane (1,1,1-TCA)	300	260/120	160	5	•-	110,000	54,000	14	35		
Trichloroethene (TCE)	4,600	5,500/3,600	5,200	14	4	10,000	11,000	700	690	. 1	10
4-Methyl-2-pentanone (MIBK)	••	/	••		••	54,000	70,000				••
trans-1,2-dichloroethene (trans-1,2-DCE)		/	75		••		1,000	2	••	•-	••
Chloroform		/	39					2			••
Toluene		/	••	6	1	80,000	140,000	••		1	
Benzene	85	110/	160	••							••
Detection level (ug/l)	50	50/50	20	1	1	1,000	1,000	1	10	1	1

^{*} Duplicate sample also analyzed -- Not detected

TABLE 3
ANALYTICAL RESULTS FROM WCC-3 SOIL SAMPLES ug/kg (ppb)

Sample No.	Sample Depth (feet)	1,1,-Dichloroethene (1,1-DCE)	1,1-Dichloroethane (1,1-DCA)	1,1,1-Trichloroethane (1,1,1-TCA)	Toluene	4-methyl-2-pentanone (MIBK)
MW-3-2-3	55	53	98	70	590	ND '
MW-3-3-3	. 65	ND	ND .	ND	8	310
Detection Limit		5	5	5	5	30

ND - not detected

BOE-C6-0070650

TABLE 4

ANALYTICAL RESULTS FROM SOIL BORINGS 15TB AND 17TB (ug/g) ppm

Sample No.	Sample Depth	1,1-DCE	TCE	2-Butanone (MEK)	1,1,1-TCA	Toluene	Ethylbenzene	Total Xylenes	4 Methyl-2- Pentanone (MIBK
15TB-3-3	10	<1	ND	ND	<1	<1	<1	<1	ND
1518-4-3	15	ND	10	160	27	870	41	460	ND
1518-5-3	20	ND	94	1,800	38	6,300	180	1,300	ND
1718-2-3	5	ND	ND	ND	ND	ND	ND	ND	ND
1718-3-3	10	ND	ND	ND	<1	<1	ND	ND	ND
718-5-3	20	ND	ND	ND	<1	<1	ND	ND	ND
718-7-3	30	ND	ND	810	ND	ND	ND	ND	840
Detection Limit									

Note:

ND - Not Detected

Borings 15TB and 17TB were installed on 24 August 1987. Boring logs and analytical data sheets are presented in Woodward-Clyde Consultants report, "Phase III Drilling Program at the Torrance (C6) Facility" dated 15 December 1987.

- 3. Analytical results obtained from water samples collected from wells WCC-1, -2, -3, -4, and -5 do not indicate the presence of petroleum hydrocarbons other than benzene and toluene. However, halogenated hydrocarbons were found in all of the water samples. The distribution of concentrations appear to indicate a primary source of these compounds near tank cluster 15T through 18T. These tanks and associated piping tested tight during the tank testing program in 1986.
- 4. Ground water elevations from the shallow semi-perched aquifer ranged from -19.72 to -21.77 feet Mean Sea Level. The negative ground water elevations indicate that the ground water is below sea level.
- 5. Data obtained from observation wells and Boring B-4 indicate that the piping at tanks 19T and 20T is not the source of the organic compounds in the ground water. The area near tank cluster 15T through 18T appears to be a more likely source. In addition, the petroleum hydrocarbons do not appear to have penetrated greater than 50 feet below the surface, and are confined to the area of Building 41.
- 6. Water samples from Well WCC-2, the upgradient well, and WCC-5, the perimeter well, had very similar, low concentrations of volatile organic compounds. This may indicate that ground water entering the site contains low levels of organic compounds. The installation of another upgradient perimeter well would be necessary to further evaluate if this condition exists.

APPENDIX A FIELD PROCEDURES AND METHODOLOGY

A.1 GENERAL INFORMATION

Drilling was performed by A & R Drilling, Inc. of Carson, California. Drilling began on 26 October 1987 and was completed on 24 November 1987. Observation wells were drilled using a CME 75 with 7-inch outside diameter (O.D.) and 10-inch O.D. hollow stem augers.

A.1.1 Observation Well Installation

Observation wells WCC-2, -3, -4, and -5 were constructed of 4-inch, Schedule 40 PVC and set to a depth of about 90 to 91 feet. The observation wells were installed by drilling a 90-foot deep pilot hole with the 7-inch O.D. hollow stem augers used for soil sampling. Upon removal of the 7-inch hollow stem auger from the hole, 10-inch O.D. hollow stem augers were used to ream the pilot hole to a 10-inch diameter. A wooden plug was placed in the lead cutting auger to prevent cuttings and water from entering the inside of the auger. Municipal water was added to the inside of augers as drilling progressed through the water table to offset the hydrostatic pressure of the fine grained flowing sands outside the augers. Two attempts were made to install Well WCC-3 without the use of water, but the bottom 3 to 5 feet of the auger "sanded-in" immediately after knocking out the wooden plug. The "sanding-in" of the augers prevented the wells from being properly constructed. Water had to be used for proper construction of WCC-2, -3, -4, and -5.

Douglas Aircraft was advised of the locations and contents of the drums, and the need for proper management of the drill cuttings.

A.1.4 Decontamination

Augers and drilling equipment were steam cleaned between borings and wells to minimize the possibility of cross-contamination. The modified California soil sampler and brass tubes were cleaned as follows:

- Deionized water wash to remove mud and soil;
- o Deionized water with Liquinox detergent;
- o Deionized water rinse to remove detergent;
- o Deionized water rinse; and
- o Dried with paper towel.

A.2 SOIL SAMPLING

Subsurface soil samples were collected at approximately 45, 55, 65, 75, and 80 feet below ground surface. Soil samples were collected for Organic Vapor Analyzer (OVA) headspace measurements, and for laboratory analyses. Soil samples were collected using a California modified sampler. The California modified sampler holds four brass tubes, and is 18 inches in length. Soil sample depths and OVA headspace measurements are shown on the Boring Logs in Appendix B.

A.2.1 OVA Headspace Measurements

Field OVA headspace measurements were taken from one of the soil samples collected at each sampling depth. This procedure was conducted by extruding the contents of one brass tube into a one pint glass jar. The jar's lid has a

A.3 FIELD OBSERVATIONS

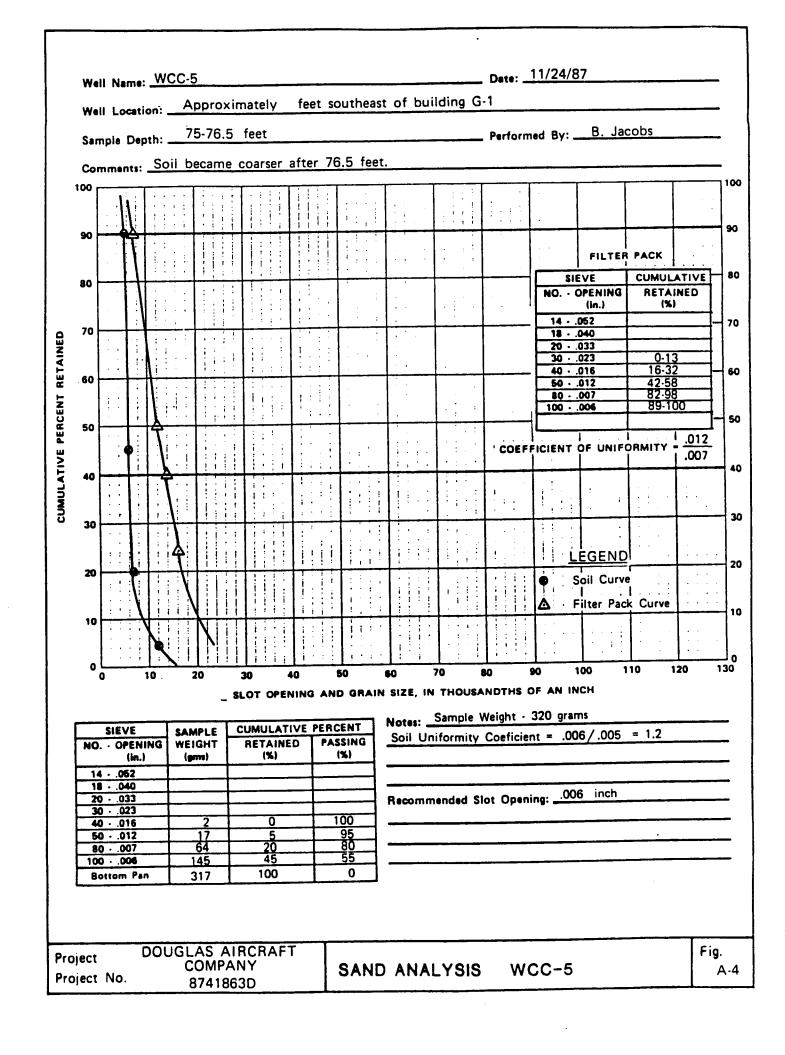
Observations made by Woodward-Clyde Consultants personnel during the drilling and sampling operations were recorded on Boring Logs, as presented in Appendix B. These observations related to visual soil classifications, geologic and stratigraphic comments, observation well construction details, sampling efforts, OVA measurements, and other pertinent information.

A.4 FILTER PACK ANALYSIS

Selection of the proper filter pack material and well screen slot size is essential in collecting a sediment-free or low sediment content water sample. In observation wells WCC-2, -3, -4, and -5 soil samples were collected from 75 or 80 feet below grade for sieve analysis. Filter pack design calculations were made based on the grain size distribution obtained from these soil samples.

Soil analyses were conducted in the field by collecting a soil sample from below the water table with a California modified sampler. The soil sample was heated with a portable propane stove to evaporate all water from the soil. When the sample was dried, it was weighed on a scale to the nearest gram. The soil sample was then poured into the top of eight sieves and shaken for approximately 5 minutes. The sieve sizes used in the analysis are shown in Figure A-1. The cumulative percent of the soil sample retained in each sieve was weighed and plotted on a sand analysis curve. It is the sand analysis curve that graphically characterizes the grain size distribution of the soil. Sand analysis curves for wells WCC-2, -3, -4, and -5 are illustrated in Figures A-1, A-2, A-3, and A-4, respectively.

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165 gallons of water removed during development. Well WCC-2 had 225 gallons removed during development. Well WCC-5 had 300 gallons removed during development. Table A-1 presents the development times and the ground water volumes removed.

The last 50 to 185 gallons removed from the four observation wells was observed to be sediment free.

Water removed from the wells during development was contained and sealed in DOT Class 17E 55-gallon drums adjacent to the wells. The drums were labeled for contents, date, and well number, and Douglas Aircraft's contact employee (Mr. Don Gerber).

Observation wells WCC-2, 3, and 4 were sampled on 2 November 1987. Well WCC-5 was sampled on 30 November 1987 and 8 January 1988. Each observation well had a minimum of three well casing volumes removed before a ground water sample was collected. Electrical Conductivity (EC) and temperature was recorded from each five gallons of ground water removed from the well. Stabilized EC and temperature values indicated that ground water from the aquifer formation was being extracted from the well. Table A-2 presents EC, temperature, and ground water volume data recorded during water sampling. The water removed from the wells is being stored on-site prior to disposal.

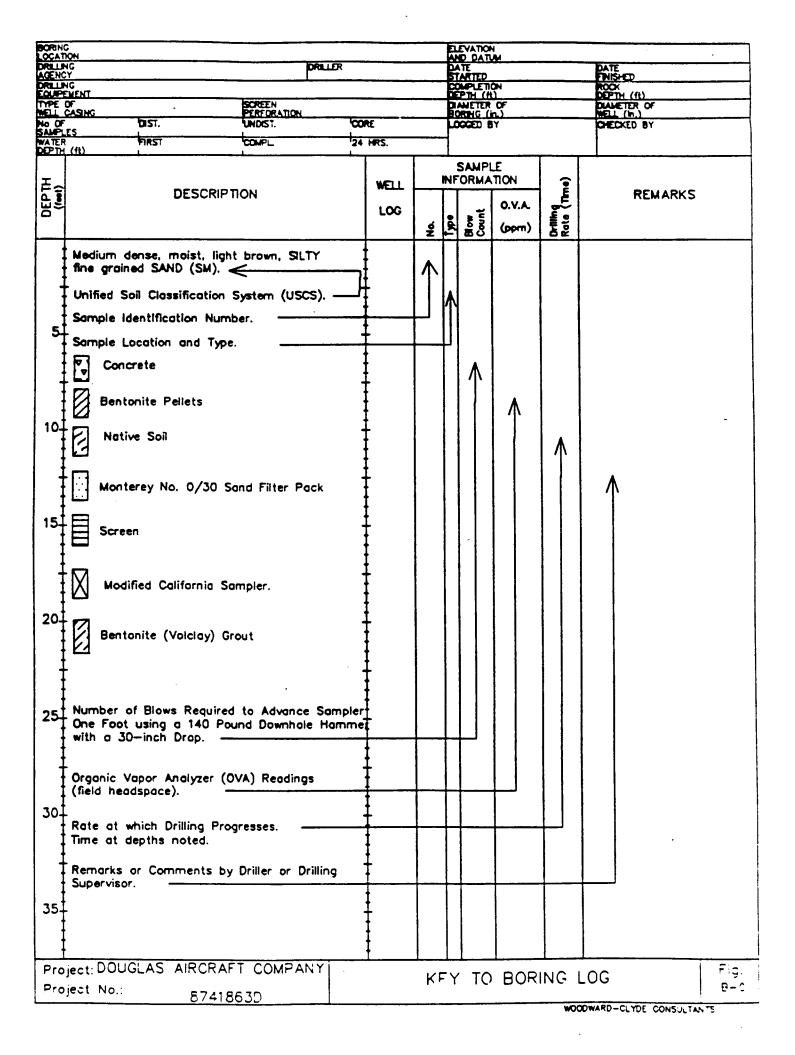
Observation wells were bailed with a 3-1/2 inch diameter PVC bailer. This bailer was washed with Liquinox detergent and rinsed with deionized water between usage in each well. The PVC bailer was only used for well volume removal and was not used for water sampling. After a minimum of three well volumes had been removed, and EC and temperature stabilized, a water sample was collected using a clean, 2-inch diameter

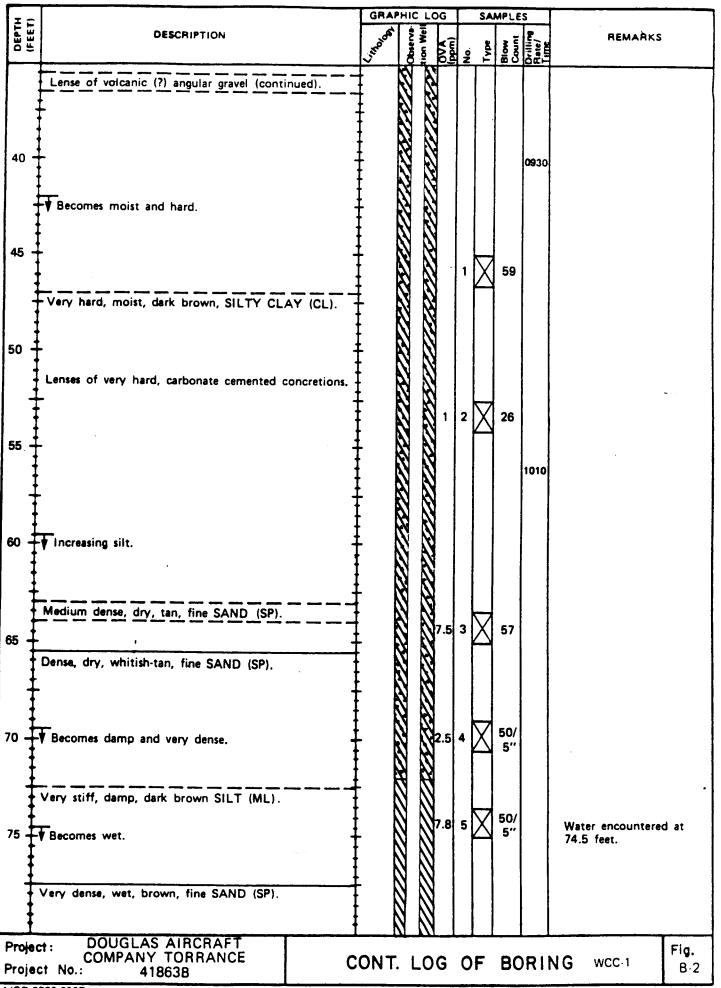
TABLE A-2
WATER SAMPLING ELECTRICAL CONDUCTIVITY AND TEMPERATURE DATA

Well No.	Sample Date	Sample Interval (gal)	Electrical Conductivity EC - umhos	Temperature C°	На
WCC-2	11/2/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	750 1,000 1,000 1,000 1,000 1,000 1,000	22.5 22.5 22.5 22.5 22.5 22.5 22.5 22.5	NA NA NA NA NA
WCC-3	11/2/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	2,250 2,100 1,950 2,000 2,000 1,900 1,800	23.0 23.0 22.5 22.5 22.5 22.5 22.5	NA HA HA NA NA HA
WCC-4	11/2/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	1,000 1,050 1,050 1,050 1,050 1,050	25.0 22.5 22.5 22.5 22.5 22.5 22.5	NA NA NA NA NA
WCC-1	11/12/87	0-2.5 2.5-5.0 5.0-7.5 7.5-10.0	1,400 1,400 1,400 1,400	22.5 22.5 22.5 22.5	NA NA NA NA
WCC-2	11/12/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	700 700 700 700 710 710 710	22.0 22.0 22.0 22.0 22.0 22.0 22.0	NA NA NA NA NA NA
wcc-3	11/12/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	2,100 2,000 1,950 1,910 1,900 1,900 1,900	22.5 23.0 23.0 23.0 23.0 23.0 23.0	NA NA NA NA NA NA
WCC-4	11/12/87	0-5 5-10 10-15 15-20 20-25 25-30 30-35	1,200 1,200 1,150 1,050 1,050 1,100 1,000	22.5 22.5 22.5 22.5 22.5 22.5 22.5 22.5	NA NA NA NA NA

(L/ABC-DAC-A2)

Teflon bailer. Each well was sampled with a different 2-inch bailer to minimize the potential for cross-contamination.



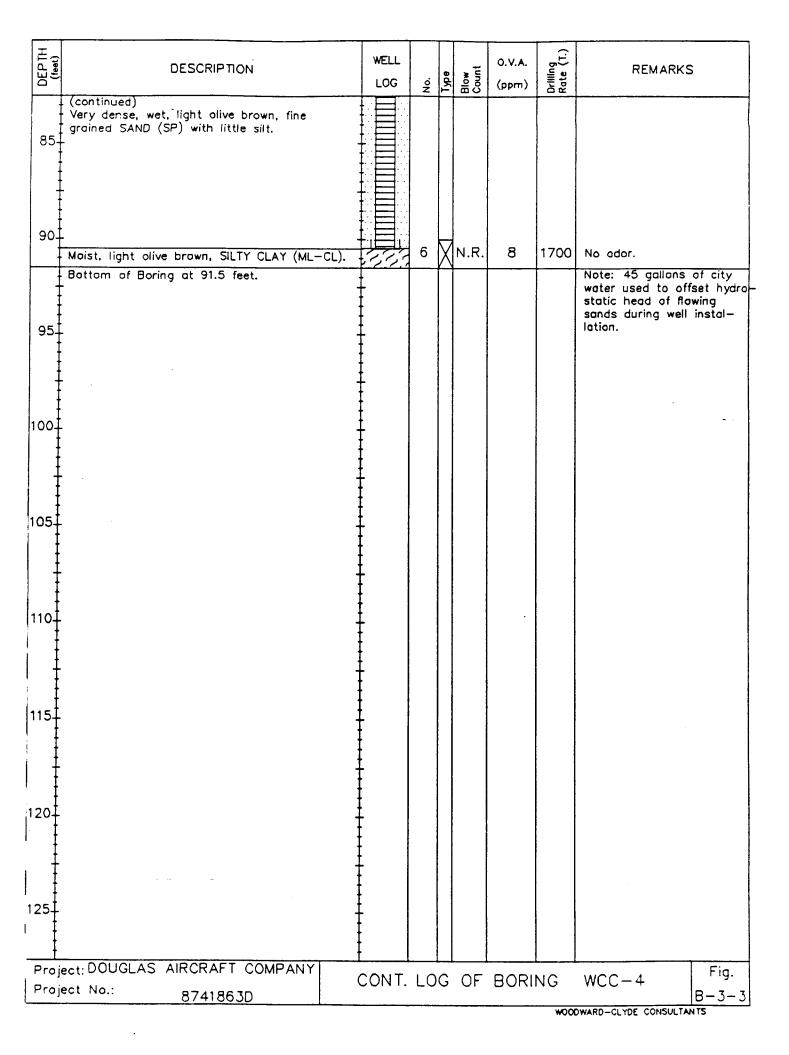


DRILLING AGENCY A & R Drilling, Inc. ORILLER M. Smith STARTED 10-28-87 FORETHING EQUIPEMENT CME 75, 10inch H.S.A. COMPLETION DEPTH (H) ORILLING EQUIPEMENT CME 75, 10inch H.S.A. COMPLETION DEPTH (H) ORILLER M. Smith STARTED 10-28-87 FORETHING DEPTH (H) ORILLER M. Smith DATE STARTED 10-28-87 FORETHING DEPTH (H) ORILLER M. Smith DATE STARTED 10-28-87 FORETHING DEPTH (H) ORILLER M. Smith DEPTH (H) ORICLER DATE DATE DATE DATE DATE DATE DATE DATE	DATE 10-28-87 PATE 10-28-87 PATE 10-28-87 PATE (Ht) PA
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SANDY CLAY (CL).	ading = 5 ppm
Becomes very dark grayish brown.	
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Color change to yellowish brown. Becomes	
stiffer less moisture, SANDY CLAY (CL).	<u>.</u> .
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15	
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Continued SANDY CLAY (CL). Less stiff, more moist.	
20 1319	
Grades to SILTY CLAY (CL).	
Medium stiff, very moist, olive brown, SILTY CLAY.	
25 1323	
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Project: DOUGLAS AIRCRAFT COMPANY	100 2 Fig.
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07410000	RD-CLYDE CONSULTANTS

DESCRIPTION	WELL LOG	No.	Type	Blow Count	0.V.A. (ppm)	Drilling Rate (T.)	REMARKS
(continued) Very dense, wet, olive, fine grained to very fine grained SILTY SAND (SM), micaceous, with some clay interbedding and iron oxide staining.		5		50/ 3"	5	1600	
90							
Bottom of Boring at 90.5 feet.	+ + + + + + + + + + + + + + + + + + + +						Note: 48 gallons of city water used to offset hydro- static head of flowing sands during well installation.
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05	† † † †						
110	+						
15	+						
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DEP TH (feet)	DESCRIPTION	- 1	MELL LOG	No.	Туре	Blow Count	0.V.A. (ppm)	Drilling Rate (T.)	REMARKS
40-	. (continued) - Stiff, moist, olivé brown, SILTY CLAY (CL)	*******						0921	
45	Lens of stiff, moist, alive, SANDY SILT (ML), micaceous with decomposed pieces of roots.			1	X	25	30	0924	Earthy odor.
50		11/11/						0937	
55	Clay becomes more stiff, interbedded with lenses of dense, maist, yellowish brown, medium grained SILTY SAND (SM) with shells, partially cemented and crystalized calcite.			2	X	30	570	0945	Moderate chemical odor.
60								1005	
65	Dense, moist, yellowish brown to olive gray, very fine grained SILTY SAND to SAND (SM-SP), micaceous.			3	X	46	440	1015	Easier drilling. Moderate to strong
	Very stiff, very moist, olive brown, SANDY SILT (ML), micaceous with iron oxide stains.								chemical odor. Very easy drilling.
70				4	X	35	+1000	1035	Strong chemical odor.
75	Becomes wet. Very dense, wet, olive brown fine grained SANI (SP) to SILTY SAND (SM).	D		5	X	59	+1000	1047	∑ Water at 73.5 feet. Strong chemical odor.
80	Becomes medium grained.			6	X	N.R.	+1000	1112	-
•	ect: DOUGLAS AIRCRAFT COMPANY ect No.: 8741863D	CC	ONT.	LO	G	OF	BORI	NG	WCC-3 Fig.
	8741863D		·					woo	B-2-2 DWARD-CLYDE CONSULTANTS

BORING	ion			wcc			e Figu	re 2				EL	EVATION DAT	N T	op of	casing @	49.69	9 ft.
DRILLIN	Y	Α	& R		ling,	lnc.	DF	RILLER	М.	Smi	th	D/ S1	ATE FARTED	10-2	7-87	DATE FINISHED	10-2	
EQUIPE	MENT				E 75,			H.S.A.					DMPLETI PTH (f	ON (91.5	ROCK DEPTH (ft)		_
WELL (OF CASING		Sch.	· 40	PVC	SCREEN PERFOR			0	Slot		Di. Bi	AMETER DRING (OF	10	DIAMETER O WELL (in.)	F	4
NO OF	ES		DIST.			UNDIST.	8	1	ORE			۲,	XCCED E	ır H. Rey	(AS	CHECKED BY	1	be .
WATER DEPTH	(ft)		FIRST		75	COMPL		124	HR:	s. 71	.6	\perp			<u> </u>	В.	Jaco	US
DEPTH (feet)				DES	CRIPTI	ON			1	ÆLL LOG	o N		Blow Count Count		Drilling Rate (Time)	RE	MARKS	
	SAND	gray (CL).				CLAY			200000	> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					1230	Backgrour reading =		
5		durk	. yello	WISH	brown,	, SILIT	CLAT	(CL).	0.08	> > > > > > > > > >						No odor.		
10																		•
15									NAME OF THE PERSON OF THE PERS					:				
20								•	N. C.									
25																		
30	— ₎							-									٠	
+	\	_ense angul	of d ar gro	lark (ovel.	greenis	h blaci	k volce	inic(?)	1					i				
						0014	m A A I V		1	1			l				r	
-	ect: DC		.A3 /	HIRC	MAFI	COM	MANY				LO	G	OF	BORII	NG	WCC-4		Fig.
Proje	ect No	•:		87	4186.	3D						_						B-3-1
															WOO	DWARD-CLYDE CO	ONSULTAN	ITS



DEPTH (feet)	DESCRIPTION	WELL LOG	No.	Туре	Blow Count	0.V.A. (ppm)	Drilling Rate (T.)	REMARKS
40 with	ist, dark yellowish brown, SILTY CLAY). (continued) h some organic roots and iron axide ining.						1445	·
45 Der bro silt.	nse, moist, dusky yellow to light alive wn, fine grained, SAND (SP) with little		1	X	34	3		No odor.
50	Interbeds of Silty Sands and Clay.							
55	and didy.		2	X	37	5	1515	No odor.
65								•
70	Becomes very dense.		3	X	70	4	1550	No odor.
75 Dens	Becomes wet. se, wet, moderate olive brown, fine gr	ained						∑ Water at 73 feet.
80	Y SAND (SM-ML).		4	X	35	3		No odor.
<u> </u>								
Project: Project	DOUGLAS AIRCRAFT COMPANY No.: 8741863D	CONT.	LO	G G	OF	BORII	1G	WCC-5 Fig. 8-4-

E

MOODWARD_CLYDE CONSENTANTS

BORING	See Location Map			ELF	VATION D DATU	l IM		Not Available
DRILLIN	G A & P Drilling Inc. DRILLER M	. Rome	ero		TE ARTED	8-24		DATE 8-24-87
DRILLIN	IG CME 15 8 inch OD HCA			ÇO	MPLETIC	ŻN ,	41	ROCK DEPTH (ft)
TYPE	i learner.	I/A		DIA	METER RING (in	OF	8	DIAMETER OF N/A
No OF	'dist. 'Undist. o 'cor				CED (B	Y		CHECKED BY
SAMPL WATER DEPTH	E3	HRS.		┥	Ρ.	Glaesr	man	M. Razmdjoo
DED IH	(tt)		i	٠	SAMPL	F		
-		uarri i	ļ		ORMA		<u> </u>	
DEPTH (feet)	DESCRIPTION	WELL		П			Ě	REMARKS
DE.		LOG			اڄ	0.V.A.	5 e	,
			ģ	P S	Blow	(ppm)	Drilling Rate (Time)	
	Asphalt covering. Medium dense, moist, yellowish brown, SILTY fine to medium grained SAND (SM), micaceous (FILL)		1	X	11	75		Little odor.
5.	Stiff to very stiff, moist, yellowish brown, SANDY		2		2	200	1510	Sample was between the tank backfill and natural material. One edge of sample included natural material, SANDY SILT (ML)
10-	SILT (ML), micaceous.		3	X	16	30	1515	No odor.
15-			4	X	12	45	1530	Slight odor.
20-			5	X	17	60	1540	Slight odor.
25-			6	X	17	950	1545	Definite odar.
30-	Olive brown, CLAYEY SILT layer (ML).		7	X	18	>1000	1600	Strong odor.
35-			8	X	16	>1000	1610	·
Pro	ject: DOUGLAS AIRCRAFT COMPANY		1 (\ \	٥٦	BORI	NG	17TB Fig.
	ject No.: 87418630		L	70	ΟF	DORI	110	2-6-1
	0/+10000	·····					WOO	DWARD-CLYDE CONSULTANTS

LOCA	TION B-1 Tanks T-19 and T-20			ELE	VAT	TUN	u			
DRIL	ING 5 5 IDRULER	Keith		DAT	E			1986	PATE	4 April 1986
DRIL	ING MENT Mobile 8-53, 9.5 Hollow Stem Auger			COM	PLE	TIO	N	50	POCK DEPTH(FT	, –
DIAM	ETER AND TYPE ELL CASING None installed			OF :	พก		TOIS	T	UNDIST 10	CORE
TYPE	OF ORATION Not Applicable			W	ATE		FIR	ST_	COMPL.	24 HRS.
TYPE	OF PERFORATION No. CO. Cond (OFOL) / Pages in Fig.	r (15%)		LOG					CHECKED	BY:
TYPE	<u> </u>			1		М.	Leac	h	В.	Jacobs
			PHIC L	.OG		SAI	MPLE	S		
DEPTH (FEET)	DESCRIPTION	- Sex	6/	MA)			_	8	REM	IARKS
2 =		Jaroiosi	Sam-	Back gn'd	ė	Type	8 3	Orilling Rete/ Time		
	Asphalt	 `	F.C	9 0				-		
	Rust colored, SILTY SAND (SM)	ᅻ								
] :	Medium stiff, moist, dark brown, SANDY CLAY	‡	1							
	Mediam stiff, moist, dark brown, SAND F CEAT	‡				abla	6			
:		‡	0.0		'	Δ	4			
5 -	Becomes very moist	‡					3			
:	200011103 1017 11101111	†								
3		<u></u>								
		ł					15			
	Becoming light reddish brown and hard	Ŧ	30		2	Χ	22	1 1		
10	Peconing light receise blown and hard	+	1				35			
1	•	Ŧ	i							-
1 1		‡	}		1					
7	•	Ŧ					6			
	•	‡	34		3	X	12	1 1		
15	Becoming light brown and very stiff	‡			ì	\sim	16	1]		
		Ţ						1 1		
1 1		_‡	1					1 1		
] -	Medium dense, moist, light brown, CLAYEY, fine-	†			Ì					
1 1	grained SAND (SC)	1	100	1	4	∇	11 8	1 1		
20		±	1.00	1		\triangle	13	1		
1 - 1	▼ Becoming lighter brown and drier	ł		1	ŀ					
l		Ŧ			Ì	1	İ			
-		‡								
		‡				k 7	8	1		
	•	‡	50	Ì	5	IX	16			
25	Very stiff, moist, light brown, SANDY CLAY (CL)	†		1		Г,	۱ ' ٔ			
‡	very still, moist, light blown, SAND I CEAT (CE)	†		1	1		}			
±		‡		}						
l		†				K	8			
		<u> </u>	45		6	X	15			
30 🗍	Very stiff, moist, light brown, CLAY (CL)	Ŧ·	1				30			
	very strii, moist, jight brown, CLAT (CL)	Ŧ			1				•	
		Ţ				1			3	
‡		7		1			9		1	•
‡	Very dense, light grayish-brown, fine-grained	‡	4		7	IX	27 50			
35	SAND (SP)	‡			1		(4"			
		†	1		1					
l		‡								
P	PGI:	<u> </u>	1		<u> </u>	ــــــــــــــــــــــــــــــــــــــ	ــــــــــــــــــــــــــــــــــــــ		<u> </u>	Fig.
Proje	50002, 10 10,, 1102		1	LO6	; (0F	В	ORI	NG B-1	B-7-
Proj	ect No.: 41863A			`					· ·	B./.
LA/OR-	0783-235R					W	000	WARD	-CLYDE C	ONSULTANTS

State Concrete Fig. State St	LOCATION Boiler Room At T-19, 20 (C-6 Facility)						ELEVATION Approximately 52 Feet MSL						
Simpo 2400SK, Datum D27-L (District Gasoline Engine) Strict	DRILLING Davis Evaluation IDENTIFE												
8° Hollow Stem Auger: No Casing in Installed or **Distall 1887 20 COMPL 24 HRS 21 HRS 20 COMPL 24 HRS 21 HRS 20 COMPL 24 HRS 21 HRS 20 COMPL 24 HRS 20 COMPL 2	ORILLING Simco 2400SK, Datum D27-L (Dietrich Gasoline Engine)						ŢĮO			HOCK -			
Second S	OF WELL CASING 6" Hollow Stem Auger; No Casing in Installed					חער			ST	UNDIST 20 CORE _			
DESCRIPTION DESCR	TVIFAL					ATT	ER	FIF	IST _	COMPL 24	ARS_		
DESCRIPTION DESCR		IBACKFILL 1970					0 81	7:	- (-1		· · · · · · · · · · · · · · · · · · ·		
DESCRIPTION Second Second		OF Concrete, #60 Silca Sand (85%) and Bentonite (1	5%)							Sd Sd			
Concrete and pea gravel. Stift, damp, clive to brown SILTY CLAY (CL.CH). Sitf, damp, clive to brown SILTY CLAY (CL.CH). Becomes olive to dark olive green. See 6 NR Sec 6 NR Sec 7 NR Drilling difficult: Stop drilling laminated. Sec 6 NR Sec 7 NR Drilling difficult: Stop drilling laminated. Sec 7 NR Sec 8 NR LOG OF BORING B.2 Fig. 8-8-1	ZF		GRA	HIC L	OG SAMPLES			MPLE	S				
Concrete and pea gravel. Stift, damp, clive to brown SILTY CLAY (CL.CH). Sitf, damp, clive to brown SILTY CLAY (CL.CH). Becomes olive to dark olive green. See 6 NR Sec 6 NR Sec 7 NR Drilling difficult: Stop drilling laminated. Sec 6 NR Sec 7 NR Drilling difficult: Stop drilling laminated. Sec 7 NR Sec 8 NR LOG OF BORING B.2 Fig. 8-8-1	9 2	DESCRIPTION	38	2 2	₹			2 5	E - 2	REMARKS			
Stift, damp, olive to brown SILTY CLAY (CL-CH). Stift, damp, olive to brown SILTY CLAY (CL-CH). Solve I becomes olive to dark olive green. Solve I beco			الحقق العقول	8 9	8.6	2	=	<u> </u>	06-				
St.) John Sile to brown SILIY CLAY (CL-CH). Becomes olive to dark olive green. A40 4 NR Becomes olive to dark olive green. A40 7 NR Drilling difficult: Stop drilling. Commence drilling at 31' on 1/5/87 with datum D27-L rig. Project: DOUGLAS TORRANCE	1 :	Concrete and pea gravel.	‡							Hydrocarbon odor			
Becomes olive to dark olive green. 140 3 NR					250	1	X	NR					
Becomes olive to dark olive green. 140 3 NR	5	· ·			300	2	X	NR		staining throughou			
20 25 30 30 30 30 30 460 7 NR Drilling difficult- Stop drilling. Commence drilling at 31' on 1/5/87 with datum D27-L rig. Project: DOUGLAS TORRANCE Project No.: 418638 LOG OF BORING B.2 Fig. B-8-1	10	•		:	140	3	X	NR					
25 30 30 30 30 30 30 30 30 30 3	15	Becomes olive to dark olive green.			440	4	X	NR					
30 Gravel lense (to 2"Ø). Head of thinly laminated.	20	-			>1000	5	X	NR					
Gravel lense (to 2"Ø). Becomes hard and grey, sandy, and thinly laminated. Becomes silty. Project: DOUGLAS TORRANCE Project No.: 418638 Drilling difficult- Stop drilling. Commence drilling at 31' on 1/5/87 with datum D27-L rig. Fig. B-8-1	25-	·			560	6	X	NR					
thinly laminated. Becomes silty. Project: DOUGLAS TORRANCE Project No.: 418638 LOG OF BORING B-2 Fig. B-8-1	30	-			460	7	X	NR		drilling. Commence drilling	at 31'		
Project No.: 418638 LOG OF BORING B-2 B-8-1	35	thinly laminated.	-		>1000	7	X	75			e (GIII		
Project No.: 418638	-			L	og)F	В	ORI	NG B2	_		
							_				0.0.1		

WOODWARD-CLYDE CONSULTANTS

LOCA	CATION Boiler Room at T-19, 20 (C-6 Facility)				ELEVATION Appoximately 52 Feet MSL						
AGEN	DRILLING Datum Exploration, Inc DRILLER Kit Stephens				DATE 1/6/87 PINISHED 1/6/87						
	DRILLING EQUIPMENT Datum D27-L (Dietrich Gasoline Engine)					TIO	N (31′	DEPTHIET) -	DEPTHIET) -	
OF W	OF WELL CASING 6" Hollow Stem Auger; No Casing Installed					PLE	TOIS BI		UNDIST. 12 CORE	UNDIST. 12 CORE _	
EAF	ORATION N/A			WATER FIRST None					one COMPL 24 HA	s 	
BACK	OF PERFORATION N/A			LOGGED BY:					CHECKED BY:		
SEAL	OF Concrete, #60 Silca Sand (85%) and Bentonite						nald		Sd		
FE	DESCRIPTION	GRAJ	GRAPHIC LO			SAN	AMPLES				
DEPTH (FEET)	DESCRIPTION	تعقمي	Son W	∀ (E	٥	*	3 3	1 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	REMARKS		
—	Concrete	13	8 3	0.5	*	=	≅ ŏ	25-			
		7				ŀ	,				
4	Dense, damp, light grey, fine SAND (SP) with FeO_2 staining and hydrocarbon odor.	#									
1	reo2 staining and hydrocarbon odor.	†			i I						
1.1	Stiff, damp, dark brown SILTY CLAY (CL-CH).	‡									
5-	•	‡		310	1, 5	abla	48				
}		‡			K	\hookrightarrow					
-		1									
1 1		Ŧ									
10	Gravel lense (≤ 2"Ø).	‡				_	20				
	Becomes hard.	‡		105	2	ΧI	30 50/		•		
1 1		‡			lľ	\exists	5"				
7	•	‡				- 1					
		7				ľ					
15	- Medium dense, damp, grey CLAYEY SAND	+				\exists			Easier drilling		
	(SC) strong hydrocarbon odor.	‡		62	3	XI	27				
1 1		Ī			lſ						
1 7		Ŧ									
		<u> </u>									
20 +	Becomes dense and greyish brown.	‡		350	lak	abla	47				
		‡		550		\triangle	۳,				
1 ‡		‡									
		‡									
] 35 }	Becomes very dense, grey, more	‡ :									
25 +	SANDY (SC-SP).	Ŧ		260	5	∇	65				
		I				\hookrightarrow			÷		
‡		†									
		†		[L						
30 +		‡		340	6	X	66				
	Bottom of Boring at 31 Feet.	†			H						
	•	‡									
ļ Ť		Ŧ							,		
I		1				İ					
35 🕂		-									
I		1									
<u> </u>		+			Ш						
Proje	ct: DOUGLAS AIRCRAFT		1 4	^^	^	\ C	9 /	י פר	N/C ~ ^ 1	ig.	
Proje	ect No.: 41863B		L(UG	U	7	Б(ORI	NG B-3	B-9-1	
LA/OR-	D783-235R					W	000	WARD	-CLYDE CONSULTAN	NTS	

DEPTH (feet)	DESCRIPTION	WE LL LOG	No.	Type	Blow Count	0.V.A. (ppm)	Drilling Rate (T.)	REMARKS
40-	Damp, gray, CLAYEY SILT (ML). on tubes.	+ + + + + + + + + + + + + + + + + + +	6		N/A	700	1550	Strong odor.
45		•	7	X	11	400	1620	Strong odor.
50	Damp, brown, SILTY fine SAND (SM-SP), micaceous.	† † † † †	8	X	11	400	1645	Strong odor.
55	· .	**************************************	9	X	11	+1000	1710	•
60	Damp, light yellowish brown, CLAYEY SILT (ML).	• • • • •	10	X	11	100	1750	Slight to moderate odor.
65	Bottom of Boring at 60.5 feet.	+ + + + + + + + + + + + + + + + + + + +						Note: Angle drilled at 26. No blow counts taken due to angle drilling.
		T						
70		† † † †						
75		I + + + + + + + + + + + + + + + + + + +						
80		† † † †						
-	ject: DOUGLAS AIRCRAFT COMPANY ject No.: 41863B	CONT.	LC)G	OF	BORI		B-4 Fig. B-10-2

April 2, 1987

WOODWARD-CLYDE 203 N. Golden Circle Drive Santa Ana, CA 92705

Attn: Allistair Callendar

JOB NO. 5557



ANALYTICAL CHEMISTS

LABORATORY REPORT

Samples: One (1) water sample Date Received: 3-27-87 Purchase Order No: 41863B

The sample was analyzed for volatile organic compounds by GCMS according to EPA method 624. The results are reported in the following Organics Analysis Data Results sheets.

Page 1 of 1

Michael Shelton Senior Chemist

D.J. Northington, Ph.D. Technical Director

WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: WOODWARD-CLYDE

SAMPLE: MW-1(41)A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED:

03/27/87

GCMS FILENAME:

5557V3

LEVEL:

LOW

MATRIX:

WATER

DATE PREPARED:

04/01/87

04/01/87

STANDARD ID:

V0A280

DATE ANALYZED:

SAMPLE AMOUNT:

INSTRUMENT ID:

5101

100UL

DETECTION

CAS # COMPOUND CONC: UG/L(PPB) LIMIT

108-90-7	CHLOROBENZENE	ND	5C
100-41-4	ETHYLBENZENE	NE	5 0.
100-42-5	STYRENE	ND	5 0.
95-47-6	TOTAL XYLENES	NE	5 0.
108-41-8	M-CHLOROTOLUENE	ND	50
95-50-1	1,2-DICHLOROBENZENE	ND	50
541-73-1	1,3-DICHLOROBENZENE	ND	50.
106-46-7	1,4-DICHLOROBENZENE	ND	50
120-82-1	1,2,4-TRICHLOROBENZENE	ND	50

Data Reporting Qualifiers

- Value If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.
- ND Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.
- TR Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.

WOODWARD-CLYDE 203 N. Golden Circle Drive Santa Ana, CA 92705

Attn: Allistair Callendar

JOB NO. 5677



ANALYTICAL CHEMISTS

LABORATORY REPORT

Samples: Seven (7) water samples

Date Received: 4-13-87 Purchase Order No: 41863B

Three of the samples were analyzed for volatile organic compounds by GCMS according to EPA method 624. The results are reported in the following Organics Analysis Data Results Sheets.

Page 1 of 1

Michael Shelton Senior Chemist

D.J. Northington, Ph.D. Technical Director

SLIENT: WOODWARD CLYDE

BAMPLE: MW-1, A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 04/13/87

GCMS FILENAME:

5677V2

LEVEL:

LOW

MATRIX:

WATER

DATE PREPARED:

04/15/87

DATE ANALYZED:

04/15/87

ND

50.

STANDARD ID:

VDA457

INSTRUMENT ID:

5100

SAMPLE AMOUNT:

100UL

120-82-1 1, 2, 4-TRICHLOROBENZENE

CAS #	COMPOUND	CONC: UG/L(P	DETECTION PB) LIMIT
108-90-7	CHLOROBENZENE		ND 50.
100-41-4	ETHYLBENZENE		ND 50.
100-42-5	STYRENE		ND 50.
95-47-6	TOTAL XYLENES		ND 50.
108-41-8	M-CHLOROTOLUENE		ND 50.
541-73-1	1.3-DICHLOROBENZENE		ND 50.
106-46-7	1,4-DICHLOROBENZENE		ND 50.
95-50-1	1,2-DICHLOROBENZENE		ND 50.

CLIENT: WOODWARD CLYDE

SAMPLE: MW-1, B

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 04/13/87 GCMS FILENAME: 5677V3
LEVEL: LOW MATRIX: WATER

DATE PREPARED: 04/15/87 DATE ANALYZED: 04/15/87

STANDARD ID: VDA457 INSTRUMENT ID: 5100 SAMPLE AMDUNT: 100UL

DETECTION CONC: UG/L(PPB) LIMIT CAS # COMPOUND 300. ND 74-87-3 CHLOROMETHANE 300. ND 74-83-9 BROMOMETHANE 300. ND 75-01-4 VINYL CHLORIDE ND 300. 75-00-3 CHLOROETHANE 500. ND METHYLENE CHLORIDE 75-09-2 ND 500. 67-64-1 ACETONE 500. ACROLEIN ND 107-02-8 500. ND 107-13-1 ACRYLONITRILE 50. ND CARBON DISULFIDE 75-15-0 2500. **50**. 1, 1-DICHLOROETHENE 75-35-4 ND 50. 1, 1-DICHLOROETHANE 75-34-3 50. ND TRANS-1, 2-DICHLOROETHENE 156-60-5 ND 50. 109-99-9 **TETRAHYDROFURAN** 50. 75-69-4 TRICHLOROFLUOROMETHANE ND 50. ND 76-13-1 FREON-TF ND 50. ETHYLENE DIBROMIDE 106-93-4 50. 123-91-1 1,4-DIOXANE ND 50. ND 96-12-8 1,2-DIBROMO-3-CHLOROPROPANE 50. 67-66-3 ND CHLOROFORM ND 50. 107-06-2 1, 2-DICHLOROETHANE 500. ND 78-93-3 2-BUTANONE 50. 120. 71-55-6 1, 1, 1-TRICHLORDETHANE ND 50. CARBON TETRACHLORIDE 16-23-5 ND 300. 108-05-4 VINYL ACETATE 50. ND BROMODICHLOROMETHANE 75-27-4 ND 50. 1, 1, 2, 2-TETRACHLOROETHANE 79-34-5 50. ND 78-87-5 1,2-DICHLOROPROPANE 50. TRANS-1, 3-DICHLOROPROPENE ND 10061-02-6 3600. 50. TRICHLORDETHENE 79-01-6 ND 50. CHLORODIBROMOMETHANE 124-48-1 ND 50. 1, 1, 2-TRICHLOROETHANE 79-00-5 50. ND BENZENE 71-43-2 ND 50. CIS-1, 3-DICHLOROPROPENE 10061-01-5 500. ND 110-75-B 2-CHLOROETHYLVINYLETHER ND 50. 75-25-2 BROMOFORM 300. ND 119-78-6 2-HEXANDNE 300. ND 4-METHYL-2-PENTANONE 108-10-1 ND 50 TETRACHLOROETHENE 127-18-4 ND 50. TOLUENE 108-88-3

CLIENT: WOODWARD CLYDE

SAMPLE: MW-1, B

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME FRACTION CONCENTRATION UG/L(PPB)

1 NONE FOUND

VDA

CLIENT: WOODWARD CLYDE SAMPLE: TRIP BLANK

ANALYSIS TYPE: EPA METHOD 8240 (624)

DRGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 04/13/87 GCMS FILENAME: 5677V4
LEVEL: LOW MATRIX: WATER
DATE PREPARED: 04/15/87 DATE ANALYZED: 04/15/87

STANDARD ID: VDA457 INSTRUMENT ID: 5100

SAMPLE AMOUNT: 5. OML

CAS #	COMPOUND	CONC:	UG/L(PPB)	DETECTION LIMIT
		*******	********	
108-90-7	CHLOROBENZENE		ND	1.
100-41-4	ETHYLBENZENE		ND	1.
100-42-5	STYRENE		ND	1.
95-47-6	TOTAL XYLENES		ND	1.
108-41-8	M-CHLOROTOLUENE		ND	1.
541-73-1	1,3-DICHLOROBENZENE		ND	1.
106-46-7	1.4-DICHLOROBENZENE	•	ND	1.
95-50-1	1,2-DICHLOROBENZENE		ND	1.
120-82-1	1, 2, 4-TRICHLOROBENZENE		ND	1.

		Woo	dward-	Clyde Consult	ants (SHIPM	IENT NO.:
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			1110	63B	vivo		`
	PROJEC	CT NO.:			Type	of Preservation	
Sample Number	Location	Type of Material	Method	Type of Container	Temp	Chemical	Analysis Required*
MW-1(41)A		Water	Brited	40 ml Viel	Cool	/	8240
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* Note - This	does not co	nstitute aut	hor zation	to proceed with anal	¥\$ 5		<u>[4] [4 - 318] -4</u>

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-2A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 11/02/87 GCMS FILENAME: 7621V1
LEVEL: LOW MATRIX: WATER
DATE PREPARED: 11/11/87 DATE ANALYZED: 11/11/87
STANDARD ID: VOA608 INSTRUMENT ID: 5100

SAMPLE AMOUNT: 5ML

CAS #	COMPOUND	UG/L(PPB)	DETECTION LIMIT
74-87-3	CHLOROMETHANE	ND	5.
74-83-9	BROMOMETHANE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
75-00-3	CHLOROETHANE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	10
67-64-1	ACETONE	ND	10.
107-02-8	ACROLEIN	ND	10.
107-13-1	ACRYLONITRILE	ND	10.
75-15-0	CARBON DISULFIDE	ND	1.
75-35-4	1,1-DICHLOROETHENE	5.	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHENE	. ND	1.
109-99-9	TETRAHYDROFURAN	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
76-13-1	FREON-TF	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
123-91-1	1,4-DIOXANE	ND	1.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	1.
67-66-3	CHLOROFORM	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
78-93-3	2-BUTANONE	ND	10.
71-55-6	1,1,1-TRICHLOROETHANE	5.	1.
16-23-5	CARBON TETRACHLORIDE	ИD	1.
108-05-4	VINYL ACETATE	ND	5.
75-27-4	BROMODICHLOROMETHANE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
78-8 7-5	1,2-DICHLOROPROPANE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
79-01-6	TRICHLOROETHENE	14.	1.
124-48-1	CHLORODIBROMOMETHANE	ND	1.
79-00- 5	1,1,2-TRICHLOROETHANE	ND	1.
71-43-2	BENZENE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
110-75-8	2-CHLOROETHYLVINYLETHER	ND	10.
75-25-2	BROMOFORM	ND	1.
119-78-6	2-HEXANONE	ND	5.
108-10-1	4-METHYL-2-PENTANONE	ND	5.
127-18-4	TETRACHLOROETHENE	ND	1.
108-88-3	TOLUENE	6.	1.

CLIENT: WOODWARD-CLYDE

SITE:

DOUGLAS AIRCRAFT

SAMPLE: MW-2A

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION CONCENTRATION

UG/L(PPB)

1 NONE FOUND

VOA

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-3A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 7621V3 11/02/87 DATE RECEIVED: WATER LOW MATRIX: LEVEL: 11/11/87 DATE ANALYZED: DATE PREPARED: 11/11/87 5100 VOA608 INSTRUMENT ID: STANDARD ID:

SAMPLE AMOUNT: 5UL

CAS #	COMPOUND	conc:	UG/ML(PPM)	DETECTION LIMIT
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108-90-7	CHLOROBENZENE		ND	1.
100-41-4	ETHYLBENZENE		ND	1.
100-42-5	STYRENE		ND	1.
95-47-6	TOTAL XYLENES		ND	1.
108-41-8	M-CHLOROTOLUENE		ND	1.
541-73-1	1,3-DICHLOROBENZENE		ND	1.
106-46-7	1,4-DICHLOROBENZENE		ND	1.
95-50-1	1.2-DICHLOROBENZENE		ND	1.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-4A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

7621V2 GCMS FILENAME: DATE RECEIVED: 11/02/87 WATER LOW MATRIX: LEVEL: 11/11/87 DATE ANALYZED: DATE PREPARED: 11/11/87 5100 INSTRUMENT ID: VOA608 STANDARD ID:

SAMPLE AMOUNT: 5ML

				DETECTION
CAS #	COMPOUND	CONC:	UG/L(PPB)	LIMIT
74-87-3	CHLOROMETHANE		ND	5.
74-83-9	BROMOMETHANE		ND	5.
75-01-4	VINYL CHLORIDE		ND	5.
75-00-3	CHLOROETHANE		ND	5.
75-09-2	METHYLENE CHLORIDE		ND	10.
67-64-1	ACETONE		ND	10.
107-02-8	ACROLEIN		ND	10.
107-13-1	ACRYLONITRILE		ND	10.
75-15-0	CARBON DISULFIDE		ND	1.
75-35-4	1,1-DICHLOROETHENE		360.	1.
75-34-3	1,1-DICHLOROETHANE		ИD	1.
156-60-5	TRANS-1,2-DICHLOROETHENE		2.	1.
109-99-9	TETRAHYDROFURAN		ND	1.
75-69-4	TRICHLOROFLUOROMETHANE		ND	1.
76-13-1	FREON-TF		ND	1.
106-93-4	ETHYLENE DIBROMIDE		ND	1.
123-91-1	1,4-DIOXANE		ND	1.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	1.
67-66-3	CHLOROFORM		2.	1.
107-06-2	1,2-DICHLOROETHANE		ND	1.
78-93-3	2-BUTANONE		ND	10.
71-55-6	1,1,1-TRICHLOROETHANE		14.	1.
16-23-5	CARBON TETRACHLORIDE		ND	1.
108-05-4	VINYL ACETATE		ND	5.
75-27-4	BROMODICHLOROMETHANE		ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE		ND	1.
78-87-5	1,2-DICHLOROPROPANE		ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE		ND	1.
79-01-6	TRICHLOROETHENE		700.	1.
124-48-1	CHLORODIBROMOMETHANE		ND	1.
79-00-5	1,1,2-TRICHLOROETHANE		ND	1.
71-43-2	BENZENE		ND	· 1.
10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	1.
110-75-8	2-CHLOROETHYLVINYLETHER		ND	10.
75-25-2	BROMOFORM		ND	1.
119-78-6	2-HEXANONE		ND	5.
108-10-1	4-METHYL-2-PENTANONE		ND	5.
127-18-4	TETRACHLOROETHENE		ND	1.
108-88-3	TOLUENE		ND	1.

DETECTION

CLIENT: WOODWARD-CLYDE

SITE: DOUGLAS AIRCRAFT SAMPLE: MW-4A

TENTATIVELY IDENTIFIED COMPOUNDS

FRACTION CONCENTRATION COMPOUND NAME UG/L(PPB)

1 CIS-1,2-DICHLOROETHYLENE

VOA

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•	PROJE	CT NAME:.	Do	us/15		DATE	11-10	707
	PROJE	CT NO.:	97	418630 -	100	0		
Sample Number	Location	Type of	Sample	Type of Container	Type	of Preservation	Analysis	Required *
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CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-1A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 11/13/87 GCMS FILENAME: 7761V2 LEVEL: LOW MATRIX: WATER DATE PREPARED: 11/16/87 DATE ANALYZED: 11/16/87

STANDARD ID: VDA450 INSTRUMENT ID: 5101

SAMPLE AMOUNT: 250UL

CAS #	COMPOUND	CONC:	UG/L(PPB)	DETECTION LIMIT
108-90-7	CHLOROBENZENE		ND	20 .
100-41-4	ETHYLBENZENE		ND	20 .
100-42-5	STYRENE		ND	20.
95-47-6	TOTAL XYLENES		ND	20.
108-41-8	M-CHLOROTOLUENE		ND	20.
95-50-1	1,2-DICHLOROBENZENE		ND	20.
541-73-1	1.3-DICHLOROBENZENE		ND	20.
106-46-7	1,4-DICHLOROBENZENE		ND	20.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-ZA

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 11/13/87 GCMS FILENAME: 7761V4
LEVEL: LOW MATRIX: WATER
DATE PREPARED: 11/16/87 DATE ANALYZED: 11/16/87
STANDARD ID: VOA450 INSTRUMENT ID: 5101

SAMPLE AMOUNT: 5ML

			DETECTION	
CAS #	COMPOUND	CONC: UG/L(PPB)	LIMIT	

74-87-3	CHLOROMETHANE	ND	5 .
74-83-9	BROMOMETHANE	ND	5 .
75-01-4	VINYL CHLORIDE	ND	5 .
75-00-3	CHLORDETHANE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	10.
67-64-1	ACETONE	ND	10.
107-02-8	ACROLEIN	ND	10.
107-13-1	ACRYLONITRILE	ND	10.
75-15-0	CARBON DISULFIDE	ND	1.
75-35-4	1,1-DICHLOROETHENE	2.	1.
75-34-3	1.1-DICHLOROETHANE	ND	1.
156-60-5	TRANS-1, 2-DICHLORDETHENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
76-13-1	FREON-TF	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
123-91-1	1,4-DIOXANE	ND	1.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	1.
67-66-3	CHLOROFORM	ND	1.
107-06-2	1.2-DICHLOROETHANE	ND	1.
78-93-3	2-BUTANONE	ND	10.
71-55-6	1, 1, 1-TRICHLOROETHANE	ND	1.
16-23-5	CARBON TETRACHLORIDE	ND	1.
108-05-4	VINYL ACETATE	ND	5 .
75-27-4	BROMODICHLOROMETHANE	ND	1.
79-34-5	1, 1, 2, 2-TETRACHLORDETHANE	ND	1.
78-87-5	1.2-DICHLOROPROPANE	ND	1.
10061-02-6	TRANS-1.3-DICHLOROPROPENE	ND	1.
79-01-6	TRICHLOROETHENE	4.	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
79-00-5	1.1.2-TRICHLOROETHANE	ND	1.
71-43-2	BENZENE	ND	, 1 .
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
110-75-8	2-CHLORDETHYLVINYL ETHER	ND	10.
75-25-2	BROMOFORM	ND	1 .
119-78-6	2-HEXANONE	ND	5 .
108-10-1	4-METHYL-2-PENTANONE	ND	5 .
127-18-4	TETRACHLOROETHENE	ND	1.
108-88-3	TOLUENE	1.	1.

SITE:

CLIENT: WOODWARD-CLYDE DOUGLAS AIRCRAFT

SAMPLE: WCC-2A

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION CONCENTRATION

UG/L(PPB)

1 NONE FOUND

VOA

M. I. E. ISKAI WESK JOHAT AMALITIJHE SERVICE

WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-3A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 11/13/87 GCMS FILENAME: 776176 LEVEL: MEDIUM MATRIX: WATER DATE PREPARED: 11/17/87 DATE ANALYZED: 11/17/87 STANDARD ID: VDA451 INSTRUMENT ID: 5101

SAMPLE AMOUNT: 5UL

CAS #	COMPOUND	CONC:	UG/ML(PPM)	DETECTION LIMIT
##########	*******************************	*********	年年本本世紀2七月19 23	
108-90-7	CHLOROBENZENE		ND	1.
100-41-4	ETHYLBENZENE		ND	1.
100-42-5	STYRENE		ND	1.
95-47-6	TOTAL XYLENES		ND	1.
108-41-8	M-CHLOROTOLUENE		ND	1.
95-50-1	1, 2-DICHLOROBENZENE		ND	1.
541-73-1	1,3-DICHLOROBENZENE		ND	1.
106-46-7	1,4-DICHLOROBENZENE		ND	1.

F.3 L→

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-4A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 11/13/87 GCMS FILENAME: 7761VB LEVEL: LOW MATRIX: WATER DATE PREPARED: 11/17/87 DATE ANALYZED: 11/17/87 STANDARD ID: VDA451 INSTRUMENT ID: 5101

SAMPLE AMOUNT: 500UL

				DETECTION
CAS #	COMPOUND	CONC:	UG/L(PPB)	LIMIT
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74-87-3	CHLOROMETHANE	ND	50 .
74-83-9	BROMOMETHANE	ND	50. 50.
75-01-4	VINYL CHLORIDE	ND	50.
75-00-3	CHLORDETHANE	ND	5 0.
75-09-2	METHYLENE CHLORIDE	ND	100.
67-64-1	ACETONE	ND	100.
107-02-8	ACROLEIN	ND	100.
107-13-1	ACRYLONITRILE	ND	100.
75-15-0	CARBON DISULFIDE	ND	10.
75-35-4	1,1-DICHLOROETHENE	1200.	10.
75-34-3	1.1-DICHLORDETHANE	ND	10.
156-60-5	TRANS-1, 2-DICHLOROETHENE	ND	10.
109-99-9	TETRAHYDROFURAN	ND	10.
75-69-4	TRICHLOROFLUOROMETHANE	ND	10.
76-13-1	FREON-TF	ND	10.
106-93-4	ETHYLENE DIBROMIDE	ND	10.
123-91-1	1.4-DIOXANE	ND	10.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	10.
67-66-3	CHLOROFORM	ND	10.
107-06-2	1,2-DICHLOROETHANE	ND	10.
78-93-3	2-BUTANONE	ND	100.
71-55-6	1.1.1-TRICHLOROETHANE	35.	10.
16-23-5	CARBON TETRACHLORIDE	ND	10.
108-05-4	VINYL ACETATE	ND	5 0.
75-27-4	BROMODICHLOROMETHANE	ND	10.
79-34-5	1, 1, 2, 2-TETRACHLOROETHANE	ND	· 10.
78-87-5	1,2-DICHLOROPROPANE	ND	10.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	10.
79-01-6	TRICHLOROETHENE	69 0.	10.
124-48-1	DIBROMOCHLOROMETHANE	ND	10.
79-00-5	1, 1, 2-TRICHLOROETHANE	ND	10.
71-43-2	BENZENE	ND	10.
10061-01-5	CIS-1, 3-DICHLOROPROPENE	ND	10.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	100.
75-25-2	BROMOFORM	ND	10.
119-78-6	2-HEXANONE	ND	50 .
108-10-1	4-METHYL-2-PENTANONE	ND	5 0.
127-18-4	TETRACHLOROETHENE	ND	10.
108-88-3	TOLUENE	ND	10.

CLIENT: WOODWARD-CLYDE

SITE:

DOUGLAS AIRCRAFT

SAMPLE:

WCC-4A

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION CONCENTRATION

UG/L(PPB)

1 NONE FOUND

VDA

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	PROJE	CT NAME:		Douglas		nate DATE	111327
	PROJE	CT NO.:		5741863	<u>E</u>		
Sample Number	Location	Type of Material	Method	Type of Container	Type Temp	of Preservation Chemical	Analysis Required*
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CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-5A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 12/01/87 GCMS FILENAME: 7911V1 LEVEL: LOW MATRIX: WATER DATE PREPARED: 12/09/87 DATE ANALYZED: 12/09/87 STANDARD ID: VOA626 INSTRUMENT ID: 5100

SAMPLE AMOUNT: 5ML

CAS #	COMPOUND	conc:	UG/L(PPB)	DETECTION LIMIT
67-64-1	ACETONE		ND	10.
107-02-8	ACROLEIN		ND	10.
107-13-1	ACRYLONITRILE		ND	10.
71-43-2	BENZENE		ND	1.
75-27-4	BROMODICHLOROMETHANE		ND	1.
75-25-2	BROMOFORM		ND	ī.
74-8 3-9	BROMOMETHANE		ND	5.
78-93- 3	2-BUTANONE (MEK)		ND	10.
75-15-0	CARBON DISULFIDE		ND	1.
16-23-5	CARBON TETRACHLORIDE		ND	1.
108-90-7	CHLOROBENZENE		ND	1.
75-00-3	CHLOROETHANE		ND	5.
110-75-8	2-CHLOROETHYLVINYLETHER		ND	10.
67-66-3	CHLOROFORM		ND	1.
74-87- 3	CHLOROMETHANE		ND	5.
108-41-8	M-CHLOROTOLUENE		ND	1.
124-48-1	DIBROMOCHLOROMETHANE		ND	1.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	5.
95-50-1	1,2-DICHLOROBENZENE		ND	1.
541-73-1	1,3-DICHLOROBENZENE		ND	1.
106-46-7	1,4-DICHLOROBENZENE		ND	1.
75-34-3	1,1-DICHLOROETHANE		ND	1.
107-06-2	1,2-DICHLOROETHANE		ND	1.
75-35-4	1,1-DICHLOROETHYLENE		7.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE		ND	1.
78-87-5	1,2-DICHLOROPROPANE		ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE		ND	1.
123-91-1	1,4-DIOXANE		ND	20.
100-41-4	ETHYLBENZENE		ND	1.
106-93-4	ETHYLENE DIBROMIDE		ND	1.
76-13-1	FREON-TF		ND	1.
119-78-6	2-HEXANONE		ND	5.
75-09-2	METHYLENE CHLORIDE		ND	10.
108-10-1	4-METHYL-2-PENTANONE (MIBK)		ND	5.
100-42-5	STYRENE		ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE		ND	1.
127-18-4	TETRACHLOROETHYLENE		ND	1.
109-99-9	TETRAHYDROFURAN		ND	1.

CLIENT: WOODWARD-CLYDE

SITE:

DOUGLAS AIRCRAFT

SAMPLE: WCC-5A

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION CONCENTRATION

UG/L(PPB)

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pecial Shipment / Handling / Storage Requirements:				Requirement	s:			
	• Nosa — This de	nes not cor	nstitute auth	norization to	proceed with anal	ysis		LA/OR -0183-42

CLIENT: WOODWARD-CLYDE

SITE: DOUGLAS AIRCRAFT

SAMPLE: WCC-5A

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 01/08/88 GCMS FILENAME: 8253V1 LEVEL: LOW MATRIX: WATER

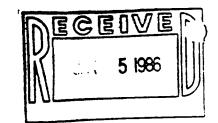
DATE PREPARED: 01/12/88
STANDARD ID: VOA484
DATE ANALYZED: 01/12/88
INSTRUMENT ID: 5101

SAMPLE AMOUNT: 5ML

CAS #	COMPOUND	CONC: UG/	L(PPB)	DETECTION LIMIT
108-88-3	TOLUENE		ND	1.
71-55-6	1,1,1-TRICHLOROETHANE		ND	1.
79-00-5	1,1,2-TRICHLOROETHANE		ND	1.
79-01-6	TRICHLOROETHYLENE		10.	1.
75-69-4	TRICHLOROFLUOROMETHANE		ND	1.
108-05-4	VINYL ACETATE		ND	5.
75-01-4	VINYL CHLORIDE		ND	5.
95-47-6	TOTAL XYLENES	-	ND	1.

Data Reporting Qualifiers

- Value If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.
- ND Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.
- TR Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.



December 31, 1986

WOODWARD-CLYDE 203 No. Golden Circle Drive Santa Ana, CA 92705

Attn: Kevin Gibson

JOB NO. 4932



ANALYTICAL CHEMISTS

LABORATORY REPORT

Samples: Two (2) soil samples

Date Received: 12-29-86

Purchase Order No: Project 41863B

The samples were analyzed for total petroleum hydrocarbon content using EPA method 418.1. The results are listed below:

Parts Per Million

Sample No.

Total Petroleum Hydrocarbons

B2-2-3 at 5' 5000 B2-7-3 at 30' 6000 Detection Limit 10

Date Analyzed: 12-30-86

Page 1 of 1

Isabella Gundran Chemist D.J. Northington, Ph.D. Technical Director

9840 Alburtis Avenue • Santa Fe Springs, California 90670 • 213 948-2225

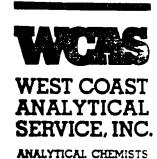
JAN 1 2 1986

January 9, 1987

WOODWARD-CLYDE 203 N. Golden Circle Drive Santa Ana, CA 92705

Attn: Kevin Gibson

JOB NO. 4968



LABORATORY REPORT

Samples: Nineteen (19) soil samples

Date Received: 1-6-87
Purchase Order No: 41863B

Ten (10) samples were analyzed for total petroleum hydrocarbons by EPA method 418.1. The results are reported below:

Parts Per Million

Sample.No.	Total Petroleum Hydrocarbons
2-7-4	14000
2-8-4	2000
2-9-4	2000
2-10-4	19000
3-1-4	29 00
3-2-4	27
3-3-4	1200
3-4-4	4400
3-5-3	13000
3-6-3	4100
Detection Limit	10

Date Extracted: 1-8-87
Date Analyzed: 1-8-87

Page 1 of 1

Isabelle Gundran Chemist.

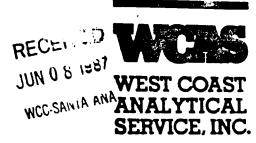
D.J. Northington, Ph.D. Technical Director

June 5, 1987

WOODWARD-CLYDE 203 N. Golden Circle Drive Santa Ana, CA 92705

Attn: Allistaire Callendar

JOB NO. 6039



ANALYTICAL CHEMISTS

LABORATORY REPORT

Samples: Seventeen (17) soil samples

Date Received: 5-27-87
Purchase Order No: 41863B

Nine (9) soil samples were analyzed for total petroleum hydrocarbon content using EPA Method 418.1. The results are on Table I.

Table I

Parts Per Million

Sample No.	Total Petroleum Hydrocarbon
B-4-1-2	ND
B-4-2-2	15000
B-4-3-2	44000
B-4-4-2	820 0
B-4-5-2	28000
B-4-6-2	6000
B-4-7-2	1500
B-4-9-2	16000
B-4-10-2	ND
Detection Limit:	10

ND - Not Detected

Date Analyzed: 6-4-87

Page 1 of 1

Isabelle Gundran Analytical Chemist

D.J. Northington, Ph.D. Technical Director

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 15TB-3-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

6926V1 GCMS FILENAME: DATE RECEIVED: 08/24/87 MATRIX: SOIL LEVEL: LOW 09/01/87 DATE PREPARED: 09/01/87 DATE ANALYZED: STANDARD ID: **VOA397** INSTRUMENT ID: 5101

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	 UG/KG(PPB)	DETECTION LIMIT
74-87-3	CHLOROMETHANE	 ND	30.
74-83-9	BROMOMETHANE	ND	30.
75-01-4	VINYL CHLORIDE	ND	30.
75-00-3	CHLOROETHANE	ND	30.
75-09-2	METHYLENE CHLORIDE	ND	50.
67-64-1	ACETONE	ND	50.
107-02-8	ACROLEIN	ND	50.
107-13-1	ACRYLONITRILE	ND	50.
75-15-0	CARBON DISULFIDE	ND	5.
75-35-4	1,1-DICHLOROETHENE	18.	5.
75-34-3	1,1-DICHLOROETHANE	ND	5.
156-60-5	TRANS-1,2-DICHLOROETHENE	ND	5.
109-99-9	TETRAHYDROFURAN	ND	5.
75-69-4	TRICHLOROFLUOROMETHANE	ND	5.
76-13-1	FREON-TF	ND	5.
106-93-4	ETHYLENE DIBROMIDE	ND	5.
123-91-1	1,4-DIOXANE	ND	5.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	5.
67-66-3	CHLOROFORM	ND	5.
107-06-2	1,2-DICHLOROETHANE	ND	5.
78-93-3	2-BUTANONE	ND	50.
71-55-6	1,1,1-TRICHLOROETHANE	570.	5.
16-23-5	CARBON TETRACHLORIDE	ND	5.
108-05-4	VINYL ACETATE	ND	30.
75-27-4	BROMODICHLOROMETHANE	ND	5.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	5.
78-87-5	1,2-DICHLOROPROPANE	ND	5.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	5.
79-01-6	TRICHLOROETHENE	ND	5.
124-48-1	DIBROMOCHLOROMETHANE	ND	5.
79-00-5	1,1,2-TRICHLOROETHANE	ND	5.
71-43-2	BENZENE	ND	5.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	50.
75-25-2	BROMOFORM	. ND	5.
119-78-6	2-HEXANONE	ND	30.
108-10-1	4-METHYL-2-PENTANONE	ND	30.
127-18-4	TETRACHLOROETHENE	ND	5.
108-88-3	TOLUENE	56.	5.

CLIENT: WOODWARD-CLYDE SITE. DOUGLAS AIRCRAFT

SAMPLE: 15TB-3-3

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME FRACTION CONCENTRATION UG/KG (PPB)

1 CHLORINATED HYDROCARBONS VOA 300.

WOODWARD-CLYDE CLIENT: DOUGLAS AIRCRAFT SITE:

SAMPLE: 15TB-4-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 6926V7 DATE RECEIVED: 08/24/87 SOIL MATRIX: LEVEL: MEDIUM 09/01/87 DATE ANALYZED: DATE PREPARED: 09/01/87 INSTRUMENT ID: 5101

VOA397 STANDARD ID:

1.0G:1ML,200UL:1ML,5 SAMPLE AMOUNT:

CAS #	COMPOUND	CONC: UG/G(PP	DETECTION M) LIMIT
108-90-7	CHLOROBENZENE		D 5.
100-41-4	ETHYLBENZENE	41.	5.
100-42-5	STYRENE	N	
95-47-6	TOTAL XYLENES	460.	5
108-41-8	M-CHLOROTOLUENE	N	_
95-50-1	1,2-DICHLOROBENZENE	N	
541-73-1	1,3-DICHLOROBENZENE	· N	_
106-46-7	1,4-DICHLOROBENZENE	N	D 5.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 15TB-5-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: GCMS FILENAME: **6926V8** 08/24/87 LEVEL: MEDIUM MATRIX: SOIL DATE ANALYZED: 09/01/87 DATE PREPARED: 09/01/87 INSTRUMENT ID: 5101 STANDARD ID: **VOA397**

SAMPLE AMOUNT: 1.0G:1ML,100UL:1ML,5

				DETECTION
CAS #	COMPOUND	CONC:	UG/G(PPM)	LIMIT
74-87-3	CHLOROMETHANE		ND	50.
74-83-9	BROMOMETHANE		ND	50.
75-01-4	VINYL CHLORIDE		ND	50.
75-00-3	CHLOROETHANE		ND	50.
75-09-2	METHYLENE CHLORIDE		ND	100.
67-64-1	ACETONE		ND	100.
107-02-8	ACROLEIN		ND	100.
107-13-1	ACRYLONITRILE		ND	100.
75-15-0	CARBON DISULFIDE		ND	10.
75-35-4	1,1-DICHLOROETHENE		ND	10.
75-34-3	1,1-DICHLOROETHANE		ND	10.
156-60-5	TRANS-1,2-DICHLOROETHENE		ND	10.
109-99-9	TETRAHYDROFURAN		ND	10.
75-69-4	TRICHLOROFLUOROMETHANE		ND	10.
76-13-1	FREON-TF		ND	10.
106-93-4	ETHYLENE DIBROMIDE		ND	10.
123-91-1	1,4-DIOXANE		ND	10.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	10.
67-66-3	CHLOROFORM		ND	10.
107-06-2	1,2-DICHLOROETHANE		ND	10.
78-93-3	2-BUTANONE		1800.	100.
71-55-6	1,1,1-TRICHLOROETHANE		38.	10.
16-23-5	CARBON TETRACHLORIDE		ND	10.
108-05-4	VINYL ACETATE		ND	50.
75-27-4	BROMODICHLOROMETHANE		ND	10.
79-34-5	1,1,2,2-TETRACHLOROETHANE	•	ND	10.
78-87-5	1,2-DICHLOROPROPANE		ND	10.
10061-02-6	TRANS-1,3-DICHLOROPROPENE		ND	10.
79-01-6	TRICHLOROETHENE		94.	10.
124-48-1	DIBROMOCHLOROMETHANE		ND	10.
79-00-5	1,1,2-TRICHLOROETHANE		ND	10.
71-43-2	BENZENE		ND	10.
10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	10.
110-75-8	2-CHLOROETHYLVINYL ETHER		ND	100.
75-25-2	BROMOFORM		ND	10.
119-78-6	2-HEXANONE		ND	50.
108-10-1	4-METHYL-2-PENTANONE		ND	50.
127-18-4	TETRACHLOROETHENE		- ND	10.
108-88-3	TOLUENE		6300.	10.
700-00-3			4330.	

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 15TB-5-3

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME FRACTION CONCENTRATION UG/G(PPM)

1 NONE FOUND

VOA

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 17TB-2-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

6926 3 GCMS FILENAME: DATE RECEIVED: 08/24/87 MATRIX: SOIL LEVEL: LOW 09/01/87 DATE PREPARED: DATE ANALYZED: 09/01/87 5101 INSTRUMENT ID: STANDARD ID: **VOA397**

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	CONC:	UG/KG(PPB)	DETECTION LIMIT
108-90-7	CHLOROBENZENE		ND	5.
100-41-4	ETHYLBENZENE		ND	5.
100-42-5	STYRENE		ND	5.
95-47-6	TOTAL XYLENES		ND	5.
108-41-8	M-CHLOROTOLUENE		ND	5.
95-50-1	1,2-DICHLOROBENZENE		ND	5.
541-73-1	1,3-DICHLOROBENZENE		ND	5.
106-46-7	1.4-DICHLOROBENZENE		ND	5.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 17TB-3-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 6926V3 DATE RECEIVED: 08/24/87 MATRIX: SOIL LEVEL: LOW DATE ANALYZED: 09/01/87 DATE PREPARED: 09/01/87 INSTRUMENT ID: 5101 **VOA397** STANDARD ID:

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	UG/KG(PPB)	LIMI
74-87-3	CHLOROMETHANE	.ND	30.
74-83-9	BROMOMETHANE	ND	30.
75-01-4	VINYL CHLORIDE	ND	30.
75-00-3	CHLOROETHANE	ND	30.
75-09-2	METHYLENE CHLORIDE	ND	50.
67-64-1	ACETONE	ND	50.
107-02-8	ACROLEIN	ND	50.
107-13-1	ACRYLONITRILE	ND	5 0.
75-15-0	CARBON DISULFIDE	ND	£
75-35-4	1,1-DICHLOROETHENE	ND	5.
75-34-3	1,1-DICHLOROETHANE	ND	5.
156-60-5	TRANS-1,2-DICHLOROETHENE	ND	5.
109-99-9	TETRAHYDROFURAN	ND	5.
75-69-4	TRICHLOROFLUOROMETHANE	ND	5.
76-13-1	FREON-TF	ND	5.
106-93-4	ETHYLENE DIBROMIDE	ND	5.
123-91-1	1,4-DIOXANE	ND	5.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	5
67-66-3	CHLOROFORM	ND	•
107-06-2	1,2-DICHLOROETHANE	ND	
78-93-3	2-BUTANONE	ND	50.
71-55-6	1,1,1-TRICHLOROETHANE	36.	5.
16-23-5	CARBON TETRACHLORIDE	ND	5.
108-05-4	VINYL ACETATE	ND	30.
75-27-4	BROMODICHLOROMETHANE	ND	5.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	5.
78-87-5	1,2-DICHLOROPROPANE	ND	5,
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹੈ ਹ
79-01-6	TRICHLOROETHENE	ND	
124-48-1	DIBROMOCHLOROMETHANE	ND	5.
79-00-5	1,1,2-TRICHLOROETHANE	ND	5.
71-43-2	BENZENE	ND	5.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	_5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	50.
75-25-2	BROMOFORM	ND	5.
119-78-6	2-HEXANONE	ND	30.
108-10-1	4-METHYL-2-PENTANONE	ND	30.
127-18-4	TETRACHLOROETHENE	ND	5.
108-88-3	TOLUENE	8.	5.

DETECTION

CLIENT: WOODWARD-CLYDE

SITE:

DOUGLAS AIRCRAFT

SAMPLE: 17TB-3-3

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION

CONCENTRATION

UG/KG(PPB)

1 NONE FOUND

VOA

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 17TB-5-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 08/24/87 GCMS FILENAME: 6926V4 SOIL MATRIX: LEVEL: LOW 09/01/87 DATE PREPARED: DATE ANALYZED: 09/01/87 INSTRUMENT ID: 5101 STANDARD ID: **VOA397**

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	CONC:	UG/KG(PPB)	DETECTION LIMIT
108-90-7	CHLOROBENZENE		ND	5.
100-41-4	ETHYLBENZENE		ND	5.
100-42-5	STYRENE		ND	5.
95-47-6	TOTAL XYLENES		ND	5.
108-41-8	M-CHLOROTOLUENE		ND	5 .
95-50-1	1,2-DICHLOROBENZENE		ND	5.
541-73-1	1,3-DICHLOROBENZENE		ND	5.
106-46-7	1.4-DICHLOROBENZENE		ND	5.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 17TB-7-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 6926V11 DATE RECEIVED: 08/24/87 LEVEL: MEDIUM MATRIX: SOIL DATE ANALYZED: 09/01/87 DATE PREPARED: 09/01/87 INSTRUMENT ID: 5101 STANDARD ID: VOA397

SAMPLE AMOUNT: 1.0G:1ML,200UL:1ML,5

CAS #	COMPOUND	CONC:	UG/G(PPM)	DETECTION LIMIT
**************************************				20
74-87-3	CHLOROMETHANE	•	ND	30. 30.
74-83-9	BROMOMETHANE		ND	30.
75-01-4	VINYL CHLORIDE		ND	
75-00-3	CHLOROETHANE		ND	30.
75-09-2	METHYLENE CHLORIDE		ND	5 0.
67-64-1	ACETONE		ND	50.
107-02-8	ACROLEIN		ND	50.
107-13-1	ACRYLONITRILE		ND	50.
75-15-0	CARBON DISULFIDE		ND	5.
75-35-4	1,1-DICHLOROETHENE		ND	5.
75-34-3	1,1-DICHLOROETHANE		ND	5.
156-60-5	TRANS-1,2-DICHLOROETHENE		ND	5.
109-99-9	TETRAHYDROFURAN		ND	5.
75-69-4	TRICHLOROFLUOROMETHANE		ND	5.
76-13-1	FREON-TF		ND	5.
106-93-4	ETHYLENE DIBROMIDE		ND	5.
123-91-1	1,4-DIOXANE		ND	5.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	5 .
67-66-3	CHLOROFORM		ND	5.
107-06-2	1,2-DICHLOROETHANE		ND	5.
78-93-3	2-BUTANONE		810.	5 0.
71-55-6	1,1,1-TRICHLOROETHANE		ND	5.
16-23-5	CARBON TETRACHLORIDE		ND	5.
108-05-4	VINYL ACETATE		ND	30.
75-27-4	BROMODICHLOROMETHANE		ND	5.
79-34-5	1,1,2,2-TETRACHLOROETHANE		ND	5.
78-87-5	1,2-DICHLOROPROPANE		ND	5.
10061-02-6			ND	5.
79-01-6	TRICHLOROETHENE		ND	5.
124-48-1	DIBROMOCHLOROMETHANE		ND	5.
79-00-5	1,1,2-TRICHLOROETHANE		ND	5.
71-43-2	BENZENE		ND	5.
10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER		ND	50.
75-25-2	BROMOFORM		ND	5.
119-78-6	2-HEXANONE		ND	30.
108-10-1	4-METHYL-2-PENTANONE		840.	30.
127-18-4	TETRACHLOROETHENE		ND	5.
108-88-3	TOLUENE		ND	5.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: 17TB-7-3

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME FRACTION CONCENTRATION UG/G(PPM)

1 NONE FOUND VOA

Woodward-Clyde Consultants



CHAIN OF CUSTODY RECORD

SHIPMENT NO.: 3

	PRO	JEC:	Τ ΝΔΙ	MF.	Do	JLLA	5 41	e coaft				DATE	8 12	787
						•		- 5000						
Sample Number	Type of Sample			Type	Temp		_	of Preservation		Analysis Required*				
Sample Walliber 2004		Material Method					<u> </u>		emical					
1578-1-3	1573	1	511	,	MOL) <u>. </u>	Pass	S TJ85	KE		NO	NE	CONTA	
1578-2.3	1		1		CAL	-1F.]	<u> </u>					ALISTA	URE
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1518-4-3												н	714-8	75-6886
15TB-5-3									\Box			11		
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1578-7-3	┼-┼-				┼	 	 		++				 	
15TB-8-3	 -				ļ	ļ							 	
1578-7-3							ļ		4-4	-			 	
17TB-1-3	DIB												<u> </u>	
778-2-3	-1				11							8240		
776-3-3	-											10	<u> </u>	
1778-4-3													<u> </u>	
										$\neg \Gamma$		8240		
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1718-7-3			<u> </u>		 	<u> </u>	-			\rightarrow			 	
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19TW-Z-3	1		1	7	<u> </u>	V	<u> </u>	V					1	<u> </u>
Total Number of	Sample	Shi	pped:	32	ノ	Sample	er's Sign	ature:	Sim	$\stackrel{\sim}{\sim}$				
Relinquished By:/	$\overline{}$	0		, –	1		Red	ceived By:	. •.					Date
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Company	wc c	=					-1 6	company	- LACA	*>	1	695		1805
Reason							- .	animad Bur			3	L		Date
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Note — This does not constitute authorization to proceed with analysis

LA OR-0183-421

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-3-2-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 7592V1 DATE RECEIVED: 10/29/87 SOIL LEVEL: LOW MATRIX: DATE PREPARED: 11/10/87 11/10/87 DATE ANALYZED: INSTRUMENT ID: 5100 STANDARD ID: **VOA607**

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	CONC:	UG/KG(PPB)	DETECTION LIMIT
74-87-3	CHLOROMETHANE		ND	30.
74-83-9	BROMOMETHANE		ND	30.
75-01-4	VINYL CHLORIDE		ND	30.
75-00-3	CHLOROETHANE		ND	30.
75-09-2	METHYLENE CHLORIDE		ND	50.
67-64-1	ACETONE		ND	50.
107-02-8	ACROLEIN		ND	50.
107-13-1	ACRYLONITRILE		ND	50.
75-15-0	CARBON DISULFIDE		ND	5.
75-35-4	1,1-DICHLOROETHENE		53.	5.
75-34-3	1,1-DICHLOROETHANE		98.	5.
156-60-5	TRANS-1,2-DICHLOROETHENE		ND	5.
109-99-9	TETRAHYDROFURAN		ND	5.
75-69-4	TRICHLOROFLUOROMETHANE		ND	5.
76-13-1	FREON-TF		ND	5.
106-93-4	ETHYLENE DIBROMIDE		ND	5.
123-91-1	1,4-DIOXANE		ND	5.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE		ND	5.
67-66-3	CHLOROFORM		ND	5.
107-06-2	1,2-DICHLOROETHANE		ND	5.
78-93-3	2-BUTANONE		ND	50.
71-55-6	1,1,1-TRICHLOROETHANE		70.	5.
16-23-5	CARBON TETRACHLORIDE		ND	5.
108-05-4	VINYL ACETATE		ND	30.
75-27-4	BROMODICHLOROMETHANE		ND	5.
79-34-5	1,1,2,2-TETRACHLOROETHANE		ND	5.
78-87-5	1,2-DICHLOROPROPANE		ND	5.
10061-02-6	TRANS-1,3-DICHLOROPROPENE		ND	5.
79-01-6	TRICHLOROETHENE		ND	5.
124-48-1	CHLORODIBROMOMETHANE		ND	5.
79-00-5	1,1,2-TRICHLOROETHANE		ND	5.
71-43-2	BENZENE		ND	5.
10061-01-5	CIS-1,3-DICHLOROPROPENE		ND	, <u>5</u> .
110-75-8	2-CHLOROETHYLVINYLETHER		ND	50.
75-25-2	BROMOFORM		ND	5.
119-78-6	2-HEXANONE		ND	30.
108-10-1	4-METHYL-2-PENTANONE		ND	30.
127-18-4	TETRACHLOROETHENE		ND	5.
108-88-3	TOLUENE		590.	5.

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-3-2-3

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME FRACTION CONCENTRATION UG/KG (PPB)

1 NONE FOUND

VOA

CLIENT: WOODWARD-CLYDE SITE: DOUGLAS AIRCRAFT

SAMPLE: MW-3-3-3

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 10/29/87 GCMS FILENAME: 7592V2 LEVEL: LOW MATRIX: SOIL DATE PREPARED: 11/10/87 DATE ANALYZED: 11/10/87 STANDARD ID: VOA607 INSTRUMENT ID: 5100

SAMPLE AMOUNT: 1.0G

CAS #	COMPOUND	CONC:	UG/KG(PPB)	DETECTION LIMIT
108-90-7	CHLOROBENZENE	· 医复数包括非常医疗生产	ND	**************************************
100-41-4	ETHYLBENZENE		ND	5.
100-42-5	STYRENE		ND	5.
95-47-6	TOTAL XYLENES		ND	5.
108-41-8	M-CHLOROTOLUENE		ND	5.
541-73-1	1,3-DICHLOROBENZENE		ND	5.
106-46-7	1,4-DICHLOROBENZENE		ND	5.
95- 50-1	1,2-DICHLOROBENZENE	, •	ND	5.

Data Reporting Qualifiers

- Value If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.
- ND Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.
- TR Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.